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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/863,376	05/24/2001	Geon Seog Son	P66694US0	9525

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01/06/2005

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EXAMINER

KERNS, KEVIN P

ART UNIT

PAPER NUMBER

1725

DATE MAILED: 01/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/863,376	Applicant(s) SON, GEON SEOG	
	Examiner Kevin P. Kerns	Art Unit 1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 16-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☒ Claim(s) 4 and 10 is/are objected to.
- 8) ☒ Claim(s) 1-27 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/9/04 & 6/28/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I (claims 1-15) in the reply filed on October 21, 2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Priority

2. Acknowledgment is made of applicant's claim for foreign priority based on five applications filed in the Republic of Korea between May 20, 1999 and October 14, 1999. It is noted, however, that applicant has not filed certified copies of the Korean applications as required by 35 U.S.C. 119(b).

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "60b" (see page 22, last line) and "280" (see page 38, 14th and 20th lines). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not

to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to because "TEMPERATURE" is misspelled in Figure 9. Also, "EVAPORATOR", "REFLECTING", and "THERMOCOUPLE" are misspelled in Figure 10. In Figure 13, it is believed that "12" and "22" are not directed to proper structures, as previously and correctly set forth in Figures 1 and 2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

In this instance, the abstract exceeds 150 words and length and extends into a second page.

6. The disclosure is objected to because of the following informalities: throughout the specification, there are numerous spelling and grammatical errors, most of which are likely due to translation. Examples are as follows: on page 2, 20th line, "Pb" should be changed to "Pd". The term "ultraultraviolet" should be changed to "ultraviolet", and "monoxide carbon" should be changed to "carbon monoxide", both of which occur on several occasions. On page 20, 11th line, "32" should be changed to "34" after "cells". On page 29, 8th line, "oxygen" should be changed to "oxygen". On page 35, 2nd line, "10" should be changed to "100". Corrections and/or clarifications are required for these and other errors that occur throughout the specification.

Claim Objections

7. Claims 4 and 10 are objected to because of the following informalities: in claim 4, 4th line, "the" should be deleted after "per". In claim 10, 3rd line, "a" should be added before "center". Appropriate correction is required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall et al. (WO 99/12638).

Hall et al. disclose a plasma reactor portion of an exhaust system for an internal combustion engine for treatment of gaseous emissions, in which the plasma reactor 1 has a reactor chamber 2 that includes two metallic grids in the form of electrodes (3,4), (406,414), or mesh electrodes (501,502) at inlet and outlet portions having active (photocatalytic or 3-way catalyst) material within reactor bed (5,33) disposed between electrodes/grids (3,4), (406,414), or (501,502); a honeycomb carrier section 22 containing a plurality of carrier cells, in which the structure of the honeycomb carrier includes wires, wire wools, weaves, bobbins, bonded or pressed sheets, discs, and rolls; and a plasma generating means (plasma protic source) in the form of AC power

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supply 6, which is capable of charging particulate material in the reactor bed 5 to a potential sufficient to excite the exhaust gases to a plasma state, with the embodiment of Figure 8 including a two stage reactor that includes plasma activated pellet bed reactor 802 and second plasma enhanced pellet bed reactor 807, both of which have catalyst beds 805 with electrodes (abstract; page 9, line 20 through page 12, line 29; page 14, line 2 through page 15, line 31; page 17, lines 9-28; page 19, line 5 through page 23, line 18; page 26, line 35 through page 28, line 29; and Figures 1-4 and 8). Although not specifically disclosed by Hall et al., one of ordinary skill in the art would have recognized that a photocatalyst layer is capable of coating each of the plurality of carrier cells within the honeycomb carrier (which would readily be varied in terms of volume and/or number by one of ordinary skill in the art), not just the inner surface adjacent the outer portions of the honeycomb carrier, for the purpose of obtaining more uniform distribution of photocatalyst on an increased surface area, improving the reduction of noxious components of exhaust gases.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Okamoto et al., Kato et al., Lecea et al., Bruck et al., and Caren et al. references are also cited in PTO-892.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number is (571)

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272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin P. Kerns *Kevin Kerns 1/4/05*
Examiner
Art Unit 1725

KPK
kpk
January 4, 2005